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1025.01 General

Pedestrians are present on most highways and transportation facilities, yet their travel mode differs vastly and sometimes is in conflict with the requirements for vehicular travel. The challenge is to provide safe and efficient facilities that address these two competing interests within a limited amount of right of way. Sidewalks and trails serve as critical links in the transportation network. Facilities that encourage pedestrian activities are a part of comprehensive transportation planning and development programs for urban and rural communities.

1025.02 References

Design Guidance, Accommodating Bicycle and Pedestrian Travel. A Recommended Approach, USDOT Policy Statement, 2001

Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), USDOT, Washington DC, 1988, including the *Washington State Modifications to the MUTCD*, M 24-01, WSDOT, 1996

RCW 46.04.160, "Crosswalk"

RCW 46.61.240, "Crossing at other than crosswalks"

RCW 47.24.010, City streets as part of state highways, "Designation-construction, maintenance-return to city or town"

RCW 47.24.020, City streets as part of state highways, "Jurisdiction, control"

HOV Direct Access Design Guide, M 22-98, WSDOT

Roadside Manual, M 25-30, WSDOT

Sidewalk Details, WSDOT, 2000

Standard Plans for Road, Bridge, and Municipal Construction (Standard Plans), M 21-01, WSDOT

Pedestrian Facilities Guidebook, incorporating Pedestrians into Washington's Transportation System, OTAK, 1997

1025.03 Definitions

accessible route An unobstructed pedestrian route that meets the requirements of the Americans with Disabilities Act accessibility guidelines.

ADA An abbreviation for the Americans with Disabilities Act of 1990. The ADA is a civil rights law that identifies and prohibits discrimination based on disability. The ADA requires public entities to design new facilities or alter existing facilities, including sidewalks and trails that are accessible to people with disabilities. Preservation projects, usually, are not considered an alteration of existing facilities. Accessibility can be addressed in preservation projects as a spot safety improvement.

bulb out A curb and sidewalk bulge or extension out into the roadway used to decrease the length of a pedestrian crossing.

crosswalk That marked or unmarked portion of a roadway designated for a pedestrian crossing.

landing A level area at the top of a pedestrian ramp.

midblock pedestrian crossing A marked pedestrian crossing located between intersections.

pedestrian facilities Walkways such as sidewalks, highway shoulders, walking and hiking trails, shared use paths, pedestrian grade separations, crosswalks, and other improvements provided for the benefit of pedestrian travel.

pedestrian-friendly A term for an environment that is safe, pleasant, and inviting to pedestrians.

pedestrian refuge island A raised area between traffic lanes that provides a place for pedestrians to wait to cross the street.

raised median A raised island in the center of a road used to restrict vehicle left turns and side street access. Pedestrians often use this median as a place of refuge when crossing a roadway.

1025.04 Policy

(1) General

Pedestrian facilities are required along and across most sections of state routes and are an integral part of the transportation system. Walkways and other pedestrian facilities are considered in the project definition phase. The only factors that will preclude providing pedestrian facilities in a project are as follows:

- Pedestrians are prohibited by law from using the facility.
- The cost of the improvements is excessive and disproportionate to the original need or probable use (as a guide, more than 20% of the original estimate).
- Low population density or other factors indicate that there is no need.

(2) Funding Programs

The adequacy of appropriate pedestrian facilities is addressed in mobility, safety, bridge replacement, and economic initiative projects in both the Highway Capitol Improvement and Preservation Programs. Federal, state, and local funds are available for pedestrian facility projects.

(a) Improvement Program

Mobility Program (I-1). Pedestrian facilities are included in improvement projects in urban areas unless the facility is restricted to motor vehicle use. In urban areas, pedestrian facilities can include traffic control devices, grade separations, crosswalks, sidewalks, and illumination. Other technologies, design features, or strategies, such as creating a pedestrian-friendly atmosphere, are generally beyond the scope of usual highway construction projects. These design features, however, can be included in a highway project when a local agency desires to participate and

can provide the necessary funding. Partnership agreements between the state and local agencies to provide pedestrian amenities are effective ways to address seemingly different goals.

In rural areas, paved roadway shoulders are usually sufficient as pedestrian facilities. In high pedestrian use areas adjacent to the highway (state parks, recreation areas, and public-owned parking lots) additional signing, marked crosswalks, and separate pedestrian paths and trails might be necessary. Separate pedestrian paths or trails are appropriate, in some circumstances, as connections between activity centers or as part of a comprehensive trails plan.

Safety Program (I-2). Pedestrian Accident Locations (PALs) are sections of state routes with four or more pedestrian collisions with vehicles in a six-year period. PALs usually have a high societal cost and compete favorably with High Accident Locations (HALs) for safety funding.

Pedestrian Risk Projects are sections of state highways that have a high risk of pedestrian collisions with vehicles based on adjacent land use, roadway geometric design, and traffic conditions. Each region has a funding allotment to address pedestrian risk locations. Short sections of sidewalks, illumination, raised medians, and other pedestrian facilities are eligible for safety funding where there are pedestrian collisions, such as part of PAL or a High Accident Corridor (HAC).

Economic Initiatives (I-3). Projects supporting tourism development, promoting the interpretation of heritage resources, and ensuring public access to rest room equipped facilities can include limited pedestrian facility improvements if the site generates pedestrian activity.

(b) Preservation Program

Roadway Program (P-1). Projects funded by the Highway Capitol Preservation Program usually do not include enhancement of existing pedestrian facilities except as minor pedestrian spot safety improvements. Other funding sources, including local agency participation through federal grants, can be used for sidewalks, walkways, or other pedestrian facilities in these projects.

Structures Program (P-2). Bridge replacement funding can be used to replace existing pedestrian facilities or to match shoulder width or sidewalks of adjacent roadways on bridges.

Other Facilities (P-3). This funding source can be used to refurbish pedestrian facilities and address ADA requirements within existing rest areas.

(3) Project Requirements

For urban mobility improvement projects (Pedestrian connectivity projects in the matrices, Chapter 325), apply the guidance in this chapter to the pedestrian facility.

For highway design elements affected by the project, apply the appropriate design level (Chapter 325) and design requirements in the applicable *Design Manual* chapters.

For highway design elements not affected by the project, no action is required.

1025.05 Pedestrian Human Factors

Understanding the human behavior of pedestrians aids in the design of effective facilities. Young children tend to dart out into traffic because they have no understanding of vehicle stopping distances or sight limitations. Older children and teenagers are more likely to cross midblock, or step out in front of oncoming traffic. Adults are more capable of perceiving and dealing with risk. Senior adults and persons with disabilities are most likely to obey crosswalk laws and make predictable movements. Senior pedestrians, as a group, also tend to have reduced vision, balance, speed, stamina, and have trouble distinguishing objects in low light and nighttime conditions.

Walking rates are an important consideration in intersection design. The average walking speed for pedestrians is 4 feet per second. Actual walking speeds, however, can vary from 2.4 to 6.0 feet per second depending on the age group. In addition, people with disabilities require more time to cross a roadway. In areas with a higher senior adult population, a walking rate of 3.0 feet per second is more realistic. This can be mitigated at locations with traffic signals by

providing longer pedestrian signal timings, or pedestrian refuge areas, such as islands and medians.

Factors that contribute to deterring pedestrian travel include:

- High vehicle volumes and speeds
- Lack of separated pedestrian facilities
- Lack of a continuous walkway system (missing links)
- Poor nighttime lighting
- Lack of connections to pedestrian activity generators
- Inaccessible to people with disabilities
- Concerns for personal safety
- Barriers on walking route (rivers, railroads, bridges without sidewalks)
- Narrow walkway width
- Lack of transit shelter

To encourage multimodal transportation, livable communities, and pedestrian safety, many agencies provide pedestrian-friendly features along their streets, roads, and highways. The following are several pedestrian-friendly practices in current use:

- ADA accessible routes
- More direct alignment of walkways to reduce travel distances
- A complete network of pedestrian connections
- Ramps and handrails for persons with disabilities
- Medians and pedestrian refuge islands
- Buffers between the walkway and roadway
- Lower vehicular speeds
- Adequate pedestrian signs, signals, and markings
- Pedestrian furniture and vegetation
- Bulb outs or curb extensions
- Adequate illumination
- Audible warning signals

1025.06 Pedestrian Activity Generators

The types of land uses that indicate high pedestrian activity are residential developments with four or more housing units per acre interspersed with multifamily dwellings or hotels located within 1/2 mile of other attractions. These attractions might be retail stores, schools, recreation areas, or senior citizen centers. Certain types of businesses, such as “deli-mart” type stores, fast food restaurants, and skateboard parks, can cater to a specific pedestrian age group and generate high activity levels.

Information on land use, development, and estimated pedestrian densities is available from metropolitan planning organizations, region planning offices, and city and county planning department comprehensive plans.

School districts designate walking routes for every elementary school. In general, children within one mile of the school are required to walk unless there are hazardous walking conditions. Contact the school district’s safety manager to determine the walking routes, average student age, transit stops, and the distance from the school to attractions. Sports, school plays, and other special events occurring after normal school hours can also generate exceptionally high levels of pedestrian activity. Consider the impact of these events when providing pedestrian facilities.

1025.07 Pedestrian Facility Design

(1) Facilities

The type of pedestrian facility provided is based on local transportation plans, the roadside environment, pedestrian volumes, user age group, safety-economic analysis, and continuity of local walkways along or across the roadway. Sidewalks can be either immediately adjacent to streets and highways or separated from them by a buffer. Walking trails, hiking trails, and shared use paths are independently aligned and generally serve recreational activities.

The type of walkway also depends on the access control of the highway as follows:

Full Access Control. Walking and hiking trails and shared use paths within the right of way are separated from vehicular traffic with physical barriers that discourage pedestrians from entering the roadway. These trails can connect with other trails outside the right of way if the access permit is modified. Grade separations are provided when the trail crosses the highway.

Partial or Modified Access Control. Walking and hiking trails and shared use paths are located between the access points of interchanges or intersections. Pedestrian crossings are usually either at-grade with an intersecting cross road or a grade separation. Midblock pedestrian crossings can be considered at pedestrian generators when the roadway has predominately urban characteristics.

Managed Access Control. In rural areas, paved shoulders are usually used for pedestrian travel. When pedestrian activity is high, separate walkways are provided. Sidewalks are used in urban areas where there is an identified need for pedestrian facilities. Trails and paths, separated from the roadway alignment, are used to connect areas of community development. Pedestrian crossings are at-grade.

(2) Pedestrian Travel Along Streets and Highways

(a) **General.** On state highways within the corporate limits of cities, the city has the responsibility for maintenance of all appurtenances beyond the curb. See RCW 47.24.020. Proposed projects that will damage or remove existing sidewalks or other walkways within the city’s jurisdiction must include reconstruction of these facilities. Examples of various types of pedestrian walkways are shown in Figures 1025-2a and 1025-2b.

The minimum clear width required by a person in a wheelchair or a walker is 3 ft. Utility poles and other fixtures located in the sidewalk can be obstacles for pedestrians with disabilities. Utility company lines, poles, and other fixtures are accommodated within the right of way. When relocation of these fixtures is necessary in a

project, determine the impact of their new location on any pedestrian walkways. Utility vaults and junction boxes with special lids are used for installations in sidewalks to reduce tripping hazards. Improvement projects might provide opportunities to eliminate existing poorly located utilities that are hazards to pedestrians.

Hanging or protruding objects within the walkway are also hazards for pedestrians with visual impairments. The minimum vertical clearance for objects overhanging a walkway, including signs, is 7 feet.

Where the walkway is located behind guardrail, protruding guardrail bolts are cut off or a rub rail is installed to prevent snagging on the bolts. These construction requirements are specified in the contract.

Provide a smooth finish to vertical concrete surfaces adjacent to a pedestrian facility to prevent snagging or abrasive injuries from accidental contact with the surface.

(b) **Shoulders.** Pedestrian activity is usually minimal along rural roadways when the adjacent land use is one or less dwelling units per acre. Determine if the roadway's shoulders are of sufficient width and condition to permit safe travel for pedestrians. Paved shoulders are preferable for an all-weather walking surface. A 4 ft wide shoulder is acceptable where pedestrian activity is minor. Wider shoulders, up to 8 or 10 feet are desirable along high-speed highways, particularly when truck volumes are high or pedestrian activity is significant.

(c) **Shared Use Paths.** Shared use paths are used by pedestrians and bicyclists. Pedestrian facilities differ from bicycle facilities in their design requirements and goals and they are not always compatible. A busy sidewalk might not be safe for bicycle travel and a well-used bike path might be unsuitable as a pedestrian walkway. When a shared use path is determined to be in the best interests of both groups, see Chapter 1020, "Bicycle Facilities," regarding shared use paths.

(d) **Walking and Hiking Trails.** Walking and hiking trails are supplemental features and are considered on a project-by-project basis. These

trails are less developed than other walkways and shared use paths and are usually unpaved. Because of their primitive nature, ADA requirements for accessibility are far less restrictive. See Figure 1025-1 for trail widths and grades. The clear area is the cross-sectional area of the trail that is cleared of limbs, exposed roots, brush, and other obstacles that might be a hazard to the hiker.

	Clear Area	Trail Width	Maximum Grade
Walking trail	8' high & 10' wide	4'	10% *
Hiking trail	8' high & 10' wide	3'	10% sustained, 20% (500' or less)

Trail Width and Grades

Figure 1025-1

* Note: When grades of 5% or more are used, provide 4 ft square resting areas adjacent to the trail every 500 ft.

(e) **Sidewalks.** Details for raised sidewalks are shown in the Standard Plans. Roadway classification and land use are important factors when considering sidewalks. Figure 1025-3 provides a generalized method of assessing the need for and adequacy of sidewalks and does not establish minimum requirements for their installation. When sidewalks are recommended for a particular roadway in this figure, conduct a more extensive study to determine if they can be justified. The most desirable installation for the pedestrian is a sidewalk separated from the traveled way by a planted buffer strip. The minimum width for the sidewalk is 5 ft and the buffer is not less than 3 ft. Where a sidewalk is separated from the traveled way with only a curb, the minimum sidewalk width is 6 feet. Wider sidewalks are used in areas of high pedestrian traffic. Sidewalks 8 ft or wider are more appropriate at these locations. In areas with heavy snowfall, snowplows might need to use the sidewalk for snow storage if there is no adjacent shoulder. Consider wider sidewalks or a sidewalk with a buffer to minimize the disruption to pedestrian travel.

A grade of 8.33% or less is required when the sidewalk is on an independent alignment and does not follow an adjacent roadway grade. Sidewalks located adjacent to a street or highway follow that facility's grade and can exceed 8.33%. On roadways with prolonged severe grades, consider providing level landings adjacent to the sidewalk at approximately 500 ft intervals as resting areas for people with physical disabilities. The cross slope of a sidewalk cannot exceed 2%. More extreme cross slopes are difficult for people in wheelchairs to negotiate.

The side slope adjacent to the sidewalk is a critical design element. See Figures 1025-2a and 2b. On embankment slopes of 4H:1V or flatter, provide a 1 ft widening at the edge of the sidewalk. On steeper embankment slopes provide a 4 ft embankment widening or use a sidewalk design with a 2 ft widening and a raised 6" high lip at the back edge of the sidewalk. When the adjacent roadway has a posted speed of 35 mph or less and there is a vertical drop-off of 2 ft 6 in or more behind the sidewalk, provide a pedestrian railing when embankment widening is not possible. Pedestrian railings are not designed to withstand vehicular impacts and cannot redirect errant vehicles. When a vertical drop off is present on a higher speed roadway, the Design Clear Zone is the primary consideration and a crash-worthy traffic barrier is required. See Chapter 700. In some cases, where the walkway is adjacent to a vertical drop off and is separated from the roadway, consider installing the traffic barrier between the travel way and the walkway. The pedestrian railing is then installed between the walkway and the vertical drop off.

Provide either raised sidewalks or ramps on the approaches to bridges when there are raised sidewalks on the bridge. The ramp is constructed of either asphalt or cement concrete and the slope of 20H:1V or flatter. These ramps can also be used as a transition from a raised sidewalk down to a paved shoulder. The ramp provides pedestrian access and mitigates the raised, blunt end of the concrete sidewalk.

(3) Pedestrian Crossings At-Grade

Wide, multilane streets are difficult for pedestrians to cross, particularly when there are

insufficient gaps in vehicular traffic because of heavy volumes. The chart in Figure 1025-4 provides guidance in determining feasible pedestrian crossings based on vehicular traffic volume and speed. Appropriate additional safety features necessary for the crossing are also recommended in this chart.

Pedestrian crossings are permitted along the length of most highways. Pedestrian crossing of all legs of an intersection is also permitted. An illegal pedestrian crossing only occurs when signs prohibit a particular crossing at an intersection or the crossing occurs between two signalized intersections. See RCW 46.61.240. Pedestrian crossings of the roadway are inevitable. Simply prohibiting a crossing without providing a reasonable option is not an effective solution and fails to address the pedestrian's needs.

Crosswalks, whether marked or not, exist at all intersections. An unmarked crosswalk is the ten-foot wide area across the intersection behind a prolongation on the curb or edge of the through traffic lane. See RCW 46.04.160. A marked crosswalk is required when the intended pedestrian route is different than that cited in the RCW. See Figure 1025-5. At roundabouts and intersections with triangular refuge islands or offset legs, the desired pedestrian crossings might not be consistent with the definition of an unmarked crosswalk and markings become necessary. Marked crosswalks also clearly define the pedestrian route and permit enforcement of pedestrian crossing laws.

The standard crosswalk marking consists of a series of wide white lines aligned with the longitudinal axis of the roadway. The lines are positioned at the edges and centers of the traffic lanes to place them out of the normal wheel path of vehicles. This type of crosswalk is a Ladder Bar and is shown in the Standard Plans.

Specially textured crosswalks (consisting of colored pavement, bricks, or other materials) are sometimes used by local agencies in community enhancement projects. These crosswalks do not fall within the legal definition of a marked crosswalk and parallel white crosswalk lines are required to define the crosswalk.

When locating crosswalks at intersections, consider the visibility of the pedestrian from the motorist's point of view. Shrubbery, signs, parked cars, and other roadside appurtenances can block the motorist's view of the pedestrian. Figures 1025-6a and 6b illustrate these sight distance problems.

In urban areas where vehicle speeds are in the range of 25 to 35 mph, a sidewalk bulb out is sometimes used to place the pedestrian at a more visible location. The bulb out also shortens the length of the pedestrian crossing and reduces the pedestrian's exposure time. At intersections with traffic signals, the bulb out can be used to reduce both pedestrian signal timing and the mast arm lengths of the signal supports. Examples of sidewalk bulb outs are shown in the Figure 1025-7. The right turn path of the design vehicle or the vehicle most likely to make this turn is a critical element in determining the size and shape of the bulb out. Sidewalk bulb outs tend to restrict the width of the roadway and can make right turns difficult for extremely long trucks. Any proposal to install bulb outs on state highways is a deviation that requires approval and documentation.

On roadways with two-way left-turn lanes with pedestrian crossing traffic caused by nearby pedestrian generators, consider removing a portion of the turn lane and installing a raised median refuge and a midblock pedestrian crossing. The installation of a midblock pedestrian crossing on a state highway, however, is a design deviation that requires approval and documentation. An example of a midblock crossing is shown in Figure 1025-8.

An engineering study is required when considering a midblock pedestrian crossing on a state highway. Conditions that might favor a midblock crossing are:

- Significant pedestrian crossings and substantial pedestrian and vehicle conflicts occur.
- The proposed crossing can concentrate or channel multiple pedestrian crossings to a single location.

- The crossing is at an approved school crossing on a school walk route.
- The adjacent land use creates high concentrations of pedestrians needing to cross the highway.
- The pedestrians fail to recognize the best or safest place to cross along a highway and there is a need to delineate the optimal location.
- There is adequate sight distance for motorists and pedestrians.

Midblock pedestrian crossings on state highways are not desirable at the following locations:

- Immediately downstream (less than 300 ft) from a traffic signal or bus stop where motorists do not expect a pedestrian to cross.
- Within 600 ft of another pedestrian crossing.
- On high speed roadways as noted in Figure 1025-4.
- Where pedestrians must cross three or more lanes of traffic in the same direction.

The minimum width of a raised median refuge area is 6 ft to accommodate people in wheelchairs. Raised medians are usually too narrow to allow the installation of ramps and a level landing. When the median is 16 ft or less in width, provide a passageway through the median. This passageway connects with the two separate roadways and cannot exceed a grade of 5%.

(4) Sidewalk Ramps

Sidewalk ramps are required at all legal crossing. These ramps provide an easily accessible connection from a raised sidewalk down to the roadway surface. To comply with ADA requirements, these ramps are at least three feet wide and have slopes $\frac{12H:1V}{10}$ or flatter. Examples of sidewalk ramps are shown in the Standard Plans and the *Sidewalk Details* guide.

The lower terminus of the sidewalk ramp is always located at the beginning of a marked or unmarked crosswalk when separate ramps are used for each direction. Diagonal ramps are used at the junction of two crosswalks. A separate sidewalk ramp is preferred for each

crossing because the crossing distance is shorter and people with vision impairments have fewer difficulties with this arrangement. Diagonal ramps are sometimes necessary when altering an existing roadway because of right of way constraints.

Surface water runoff from the roadway can flood the lower end of a sidewalk ramp. Determine the grades along the curb line and provide catch basins or inlets to prevent the flooding of the ramps. Figure 1025-9 shows examples of how drainage structures are located. Verify that the drainage structure will not be in the path of a wheelchair user.

A level landing is necessary at the top of a sidewalk ramp. This landing is provided to allow a person in a wheelchair room to maneuver into a position to use the ramp or to bypass it. In alterations of existing roadways, the landings must be at least three feet square. In new construction, a four-foot square landing is required. When right of way constraints are not an issue, provide a larger five-foot square landing. If the landing is next to a vertical wall, a five-foot wide clear area is desirable to allow a person in a wheelchair more room to maneuver. Examples of these wheelchair maneuvers are shown in the *Sidewalk Details* guide. When the upper area of a sidewalk ramp is adjacent to a vertical wall, a 5 ft clearance from the edge of the ramp to the wall is desirable.

At signalized intersections, the pedestrian push buttons are located near the sidewalk ramps for ADA accessibility. See Chapter 850, “Traffic Control Signals,” for information on pedestrian requirements at traffic signal locations.

(5) Pedestrian Grade Separations

In areas where heavy pedestrian traffic is present and opportunities to cross the roadway are infrequent, consider providing a pedestrian grade separation. When considering a pedestrian structure, determine if the conditions that require the crossing are permanent. If there is a likelihood that the pedestrian activity generator might not exist in the near future, consider less costly solutions. Locate the grade separated crossing where pedestrians are most likely to cross the roadway. A crossing might not be used if the pedestrian is required to deviate significantly

from a more direct route. A structure might be under-utilized if the additional average walking distance for 85 percent of the pedestrians exceeds 1/4 mile. It is sometimes necessary to install fencing or other physical barriers to channel the pedestrians to the structure and reduce the possibility of undesired at-grade crossings. Pedestrian grade separations are more effective when the roadway is below the natural ground line as in a “cut” section. Elevated grade separations, where the pedestrian is required to climb stairs or use long approach ramps, tend to be under-utilized.

Grade separated structures are proposed during the planning stage of a project because of the high costs associated with their design and construction. Consider grade-separated crossings under the following conditions:

- Where there is moderate to high pedestrian demand to cross a freeway or expressway
- Where there is a large number of young children, particularly on schools routes, who regularly cross a high speed or high volume roadway
- On streets with high vehicular volumes and high pedestrian crossing volumes, and crossings are extremely hazardous for pedestrians

The Headquarters (HQ) Bridge and Structures Office designs pedestrian grade separation bridges and tunnels on a project-by-project basis. Railings 3 ft 6 in high are provided on pedestrian bridges. The bridge rail is designed so that a 6-inch sphere cannot pass through any part of the railing. In addition, a 2 ft 6 in to 2 ft 10 in high handrail is provided for grades greater than 5%. The minimum width between the railings of an overhead structure or the vertical walls of a tunnel is 8 ft. The minimum overhead clearance for a tunnel is 10 ft. Protective screening to prevent objects from being thrown from an overhead pedestrian structure is sometimes necessary. See Chapter 1120, “Bridges.”

The minimum vertical clearance from the bottom of the pedestrian structure to the roadway beneath is 17 ft 6 in. This minimum height requirement can affect the length of the pedestrian ramps to the structure. To comply with ADA requirements, a ramp cannot have a grade exceeding 8.33% and the maximum rise of the ramp cannot exceed 2 ft 6 in without landings. Landings are a minimum of 5 ft wide and 5 ft long except the landing at the bottom of the ramp, which is 6 ft in length. When ramps are not feasible, provide both elevators and stairways. Stairways are designed in accordance with the Standard Plans.

Pedestrian tunnels are an effective method for providing crossings for roadways located in embankment sections. When possible, design the tunnel with a nearly level profile to provide complete vision from portal to portal. Pedestrians are reluctant to enter a tunnel with a depressed profile because they are unable to see if the tunnel is occupied. Police officers also have difficulty patrolling depressed profile tunnels. Provide day and nighttime illumination within the pedestrian tunnel. Installing gloss-finished tile walls and ceilings can also enhance light levels within the tunnel.

(6) Transit and School Bus Stops

The location of transit stops is an important consideration in providing appropriate pedestrian facilities. See Chapter 1060, "Transit Benefit Facilities." A transit stop on one side of a street usually has a counterpart on the opposite side because transit routes normally function in both directions on the same roadway. When passengers use this type of route, they will either cross the street at the beginning of a trip or the end of the return trip. Pedestrian collisions are more frequent at these locations. When analyzing high pedestrian accident locations, consider the presence of nearby transit stops and the opportunities for a pedestrian to safely cross the street. At-grade midblock pedestrian crossings are effective at transit stop locations on roadways with lower vehicular volumes. Pedestrian grade separations are appropriate at midblock locations when vehicular traffic volumes prohibit pedestrian crossings at grade.

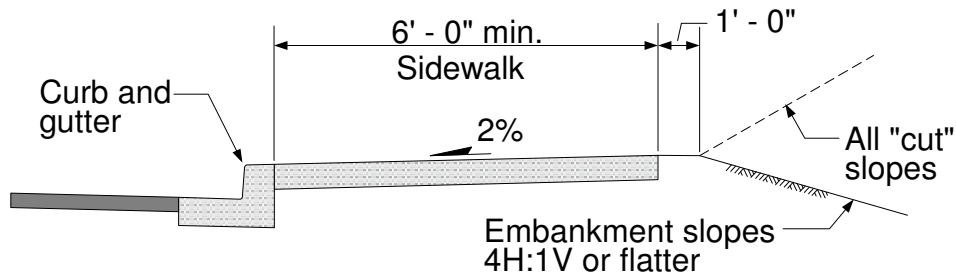
School bus stops are typically adjacent to sidewalks in urban areas and along shoulders in rural areas. Determine the number of children using the stop and provide an appropriate waiting area. Children, because of their smaller size, might be difficult for motorists to see at crossings or stops. Determine if utility poles, vegetation, and other roadside features interfere with the motorist's ability to see the children. When necessary, relocate the obstructions or move the bus stop. Parked vehicles can also block visibility and parking prohibitions might be necessary near the bus stop.

(7) Illumination and Signing

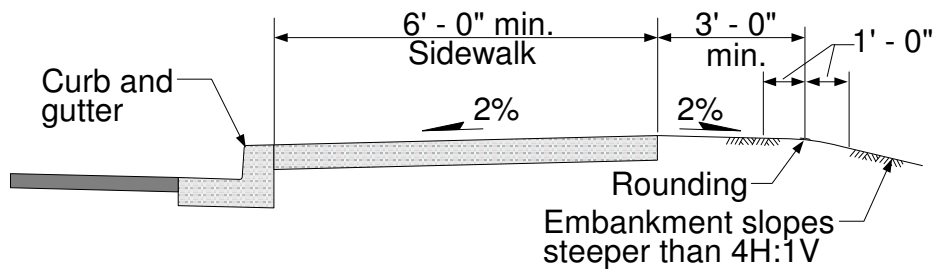
In Washington State, the highest number of collisions between vehicles and pedestrians occur in the months November through February when there is poor visibility and fewer daylight hours. At high pedestrian accident locations, illumination of pedestrian crossings and other walkways is an important design consideration. Illumination provided solely for vehicular traffic is not always effective in lighting parallel walkways for pedestrians. Consider additional lighting, mounted at a lower level, for walkways with considerable nighttime pedestrian activity. Design guidance for illumination is in Chapter 840. See Chapter 820 and the MUTCD for pedestrian related signing.

1025.08 Documentation

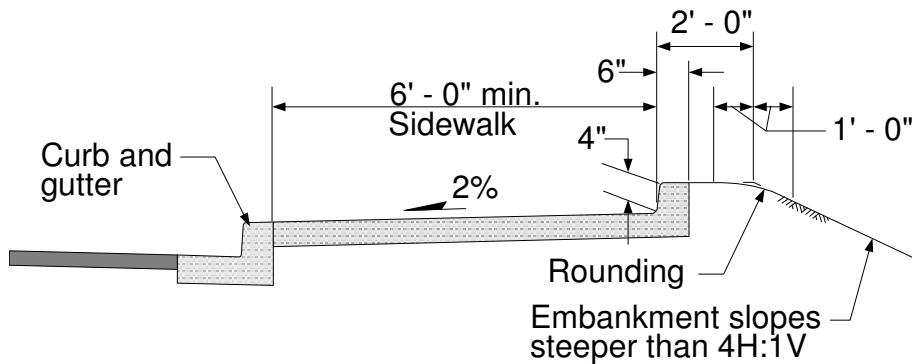
A list of documents that are to be preserved [in the Design Documentation Package (DDP) or the Project File (PF)] is on the following website: <http://www.wsdot.wa.gov/eesc/design/projectdev/>



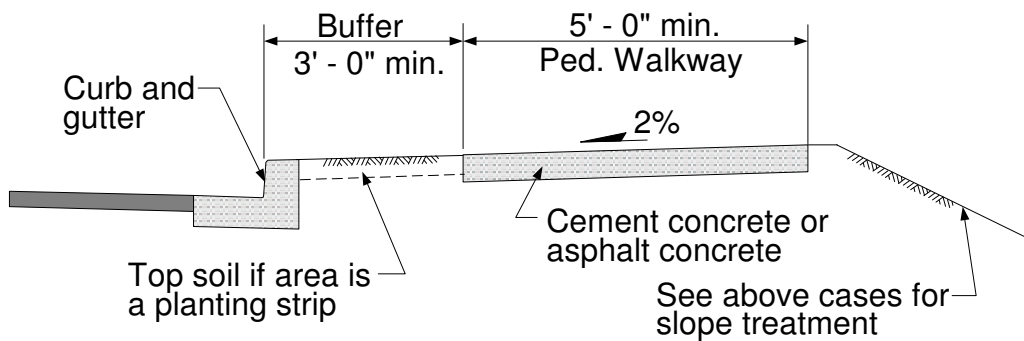
Case A



Case B

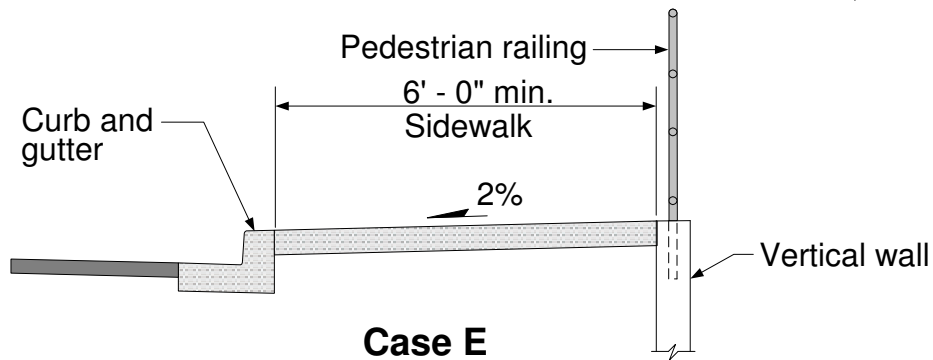


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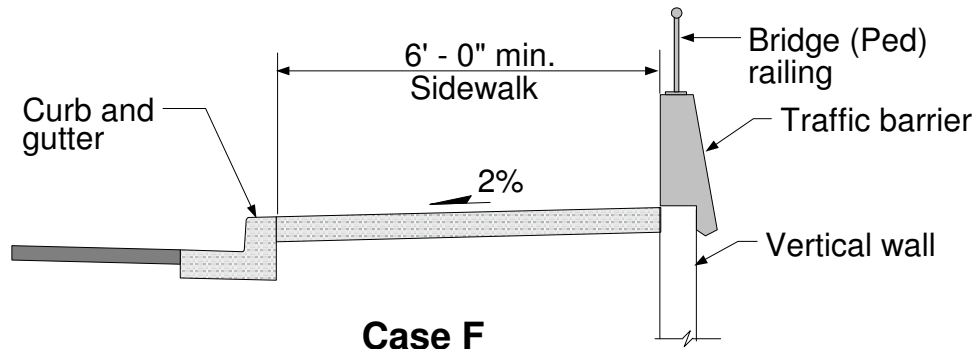


Case D

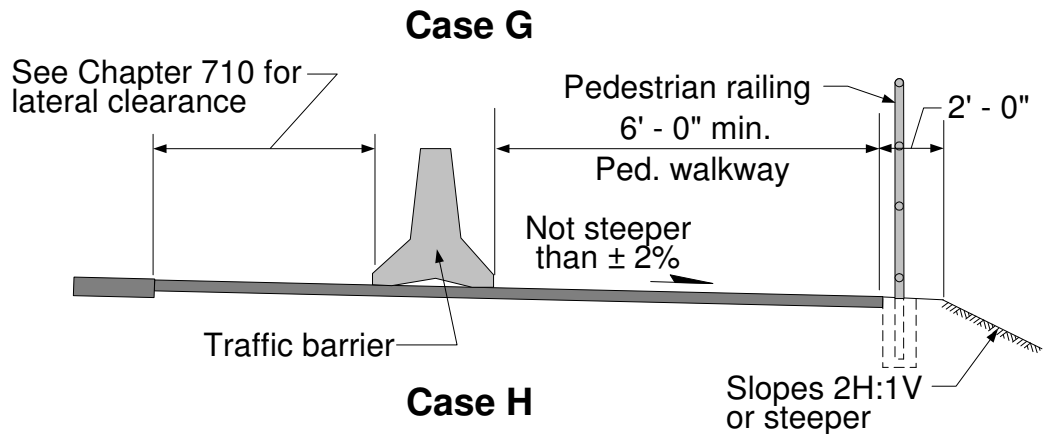
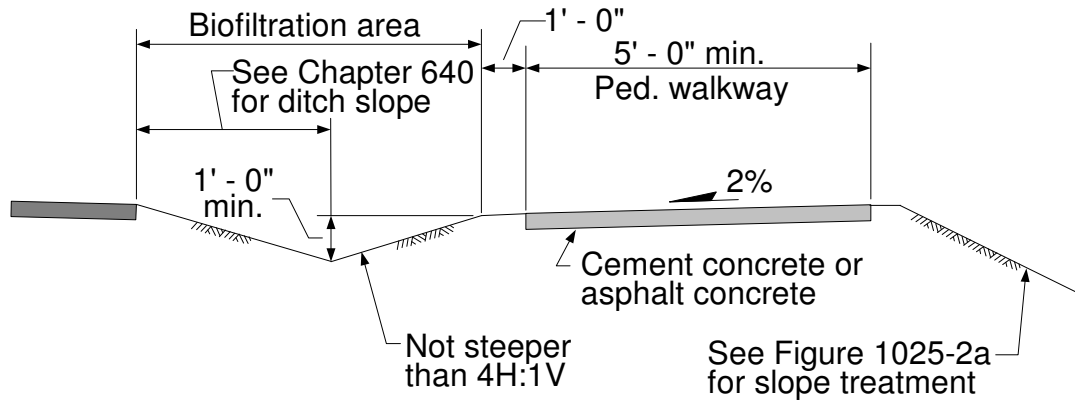
Pedestrian Walkways
Figure 1025-2a



When the wall is outside of the Design Clear Zone



When the wall is within the Design Clear Zone



Pedestrian Walkways
Figure 1025-2b

Roadway classification & land use	Sidewalk recommendations
Rural highways (less than one dwelling unit per acre)	No sidewalk recommended. Shoulder (four feet minimum width) adequate.
Suburban highways (one or less dwelling units per acre)	Sidewalk on one side desirable. Four feet wide shoulders adequate.
Suburban highway (2 to 4 dwelling units per acre)	Sidewalks on both sides of roadway desirable. Sidewalk on one side recommended.
Major arterial in residential area	Sidewalks on both sides of roadway recommended.
Collector or minor arterial in residential area	Sidewalks on both sides of roadway recommended.
Local street in residential area with less than 1 dwelling unit per acre	Sidewalk on one side desirable. Four feet wide shoulders adequate.
Local street in residential area with 1 to 4 dwelling units per acre	Sidewalks on both sides of roadway desirable. Sidewalk on one side recommended.
Local street in residential area with more than 4 dwelling units per acre	Sidewalks on both sides of roadway recommended.
Streets in commercial area	Sidewalks on both sides of roadway recommended
Streets in industrial area	Sidewalks on both sides of roadway desirable. Sidewalk on one side recommended.

Sidewalk Recommendations

Figure 1025-3

Traffic Volume ADT	Speed	Roadway Type			
		Two Lane	Three Lane	Multilane (4 or more lanes) with raised median	Multilane (4 or more lanes) without raised median
Less Than 9,000	30 mph or less	marked crosswalk	marked crosswalk	marked crosswalk	marked crosswalk
	35 mph	marked crosswalk	marked crosswalk	marked crosswalk	marked crosswalk
	40 mph or higher	marked crosswalk	marked crosswalk	marked crosswalk	marked crosswalk
9,000 to 11,999	30 mph or less	marked crosswalk	marked crosswalk	marked crosswalk	marked crosswalk
	35 mph	marked crosswalk	marked crosswalk	marked crosswalk	additional enhancement
	40 mph or higher	marked crosswalk	marked crosswalk	marked crosswalk	additional enhancement
12,000 to 14,999	30 mph or less	marked crosswalk	marked crosswalk	additional enhancement	additional enhancement
	35 mph	marked crosswalk	additional enhancement	additional enhancement	not recommended
	40 mph or higher	additional enhancement	not recommended	not recommended	not recommended
More than 15,000	30 mph or less	marked crosswalk	additional enhancement	additional enhancement	not recommended
	35 mph	additional enhancement	not recommended	not recommended	not recommended
	40 mph or higher	additional enhancement	not recommended	not recommended	not recommended

Notes:

These guidelines include intersection and midblock location with no traffic control signals or stop signs on the approach to the crossing. They do not apply to school crossings. A two-way left-turn lane is not considered a median. This chart is used in conjunction with an engineering study of pedestrian volumes, model vehicle operating speeds, sight distance, vehicle mix, and comparison to similar sites.

Meaning of terms in chart:

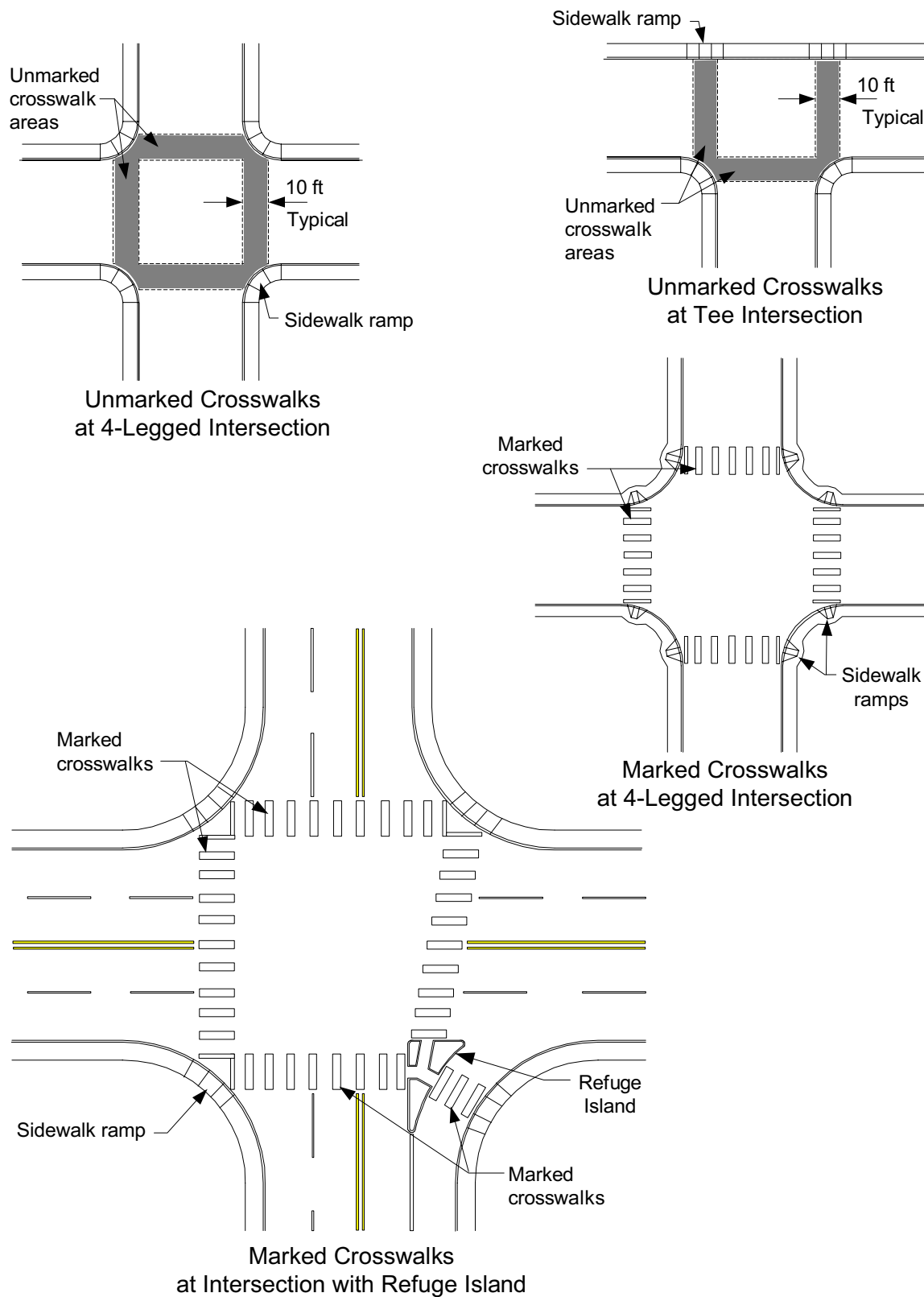
Marked crosswalk: Marked crosswalk can be installed at these locations.

Additional enhancements: Marked crosswalks can be used with additional safety items such as overhead illumination, curb bulb outs, flashing beacons, illuminated signing, or an in-roadway flashing light system.

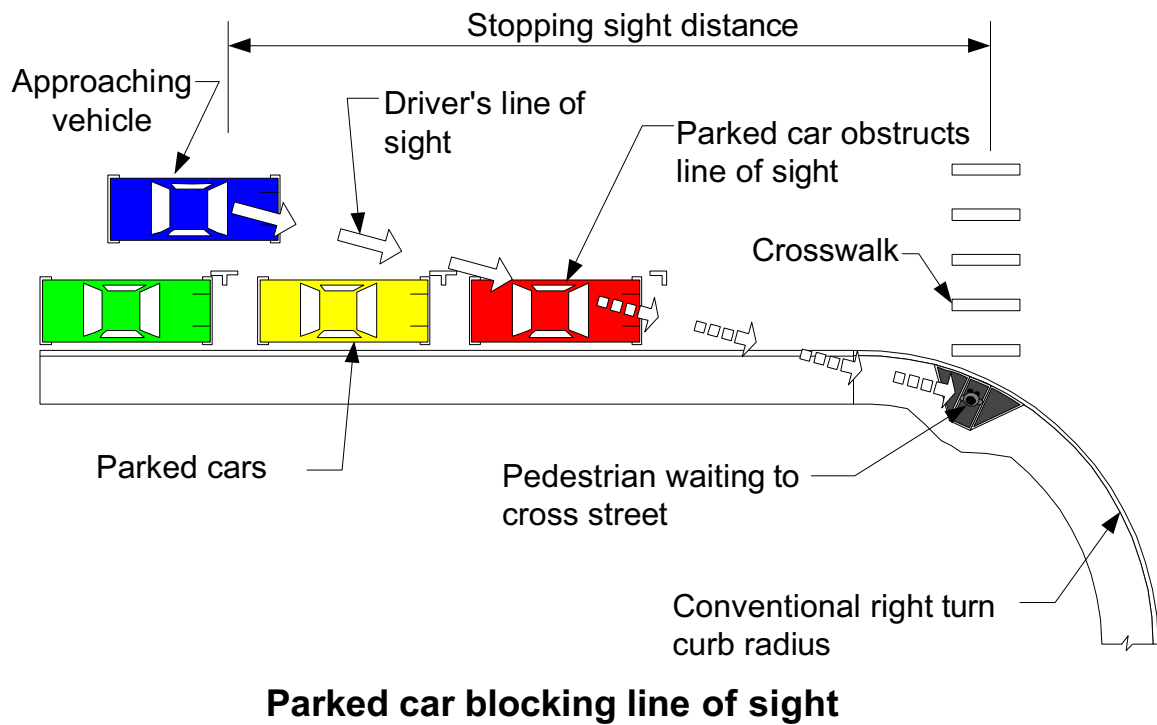
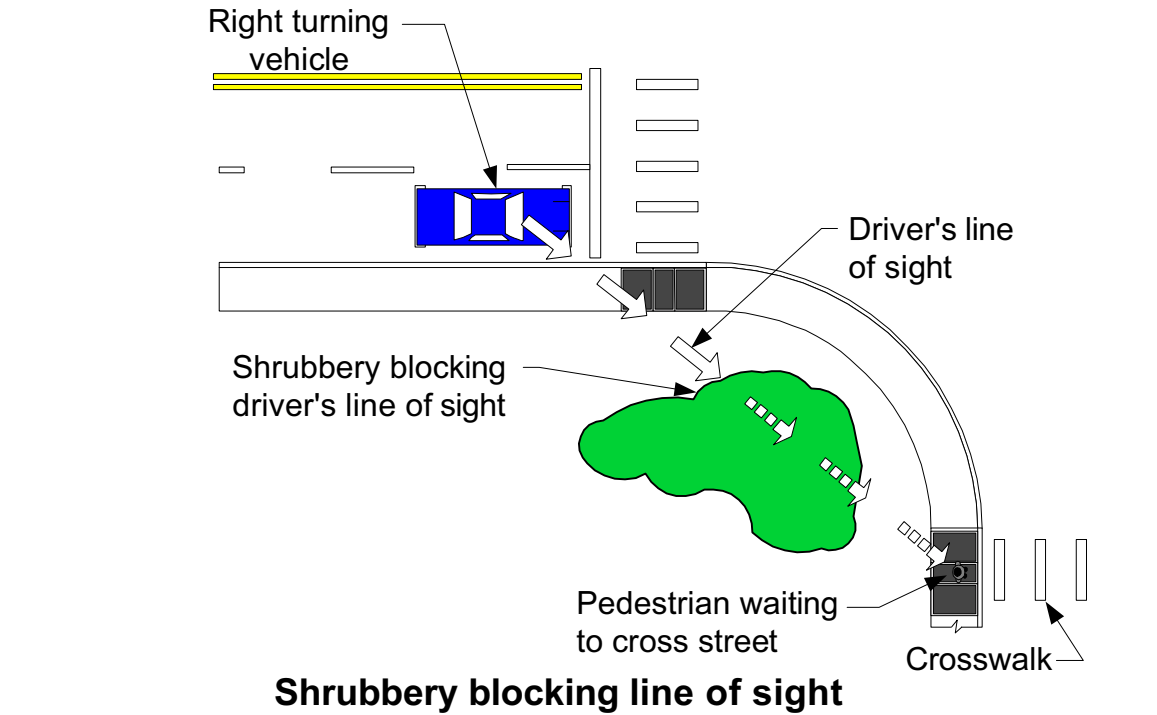
Not recommended: A marked crosswalk is not recommended under these conditions without positive vehicular traffic control such as stop signs or traffic control signals.

Marked Crosswalk Recommendations at Unsignalized Pedestrian Crossings

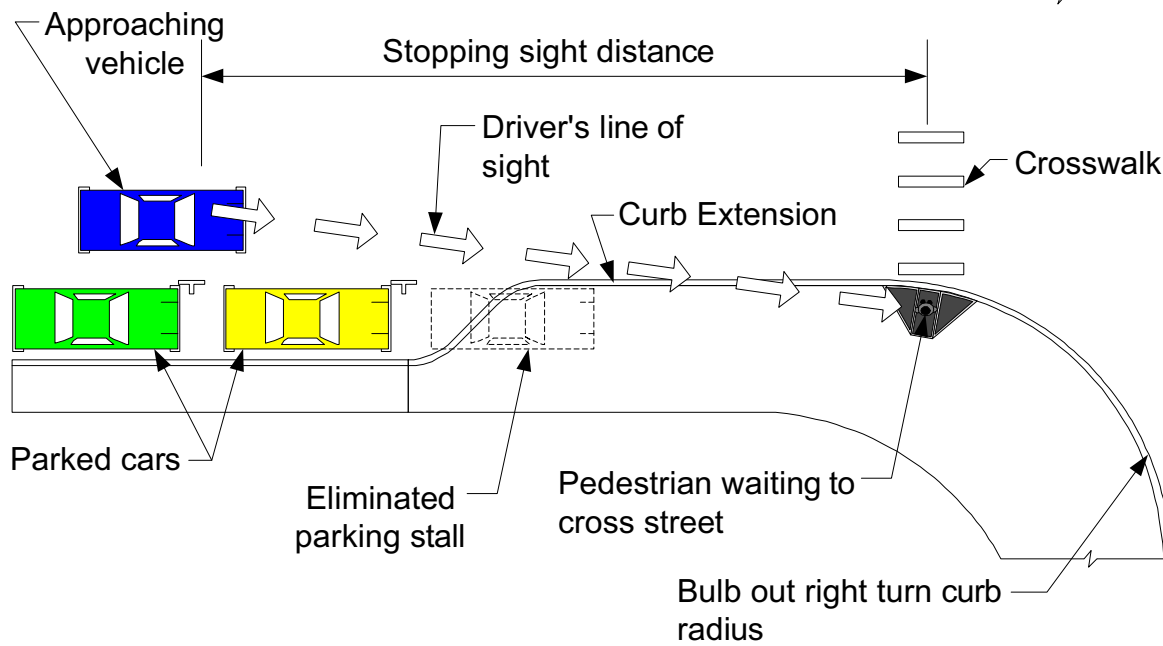
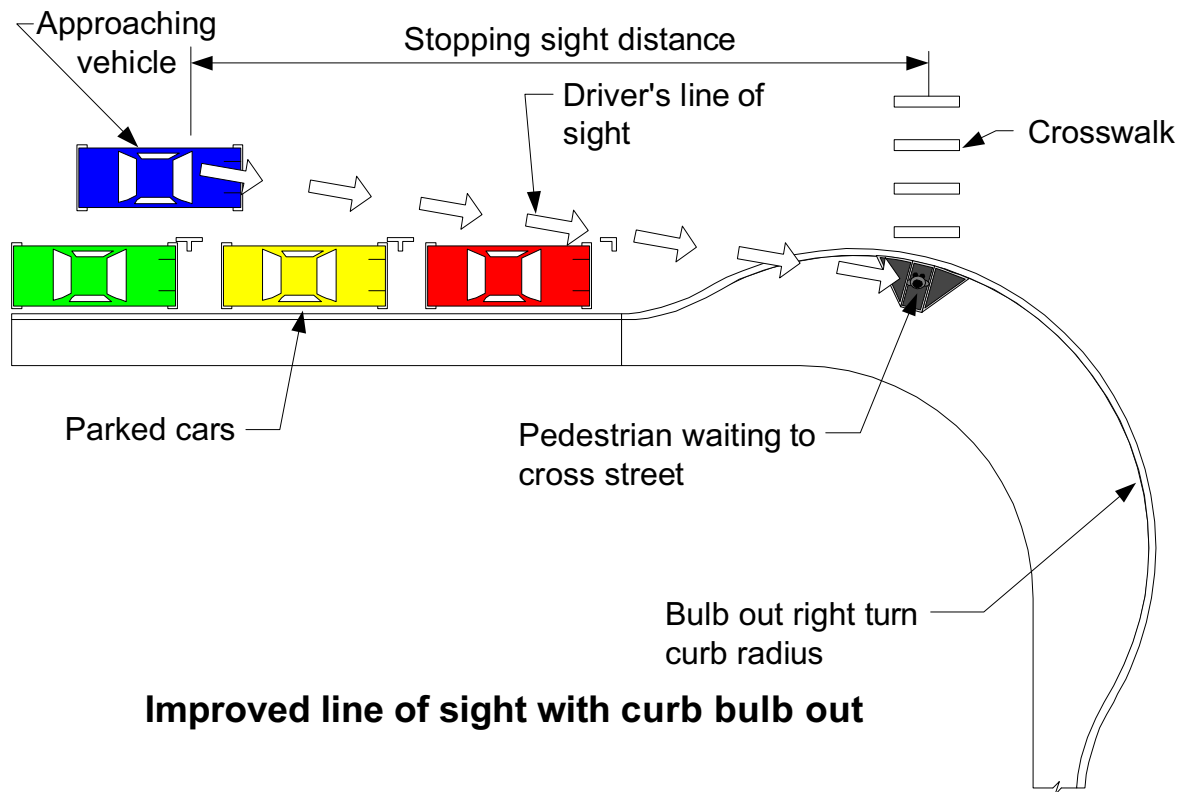
Figure 1025-4



Crosswalk Locations
Figure 1025-5



Sight Distance at Intersections
Figure 1025-6a



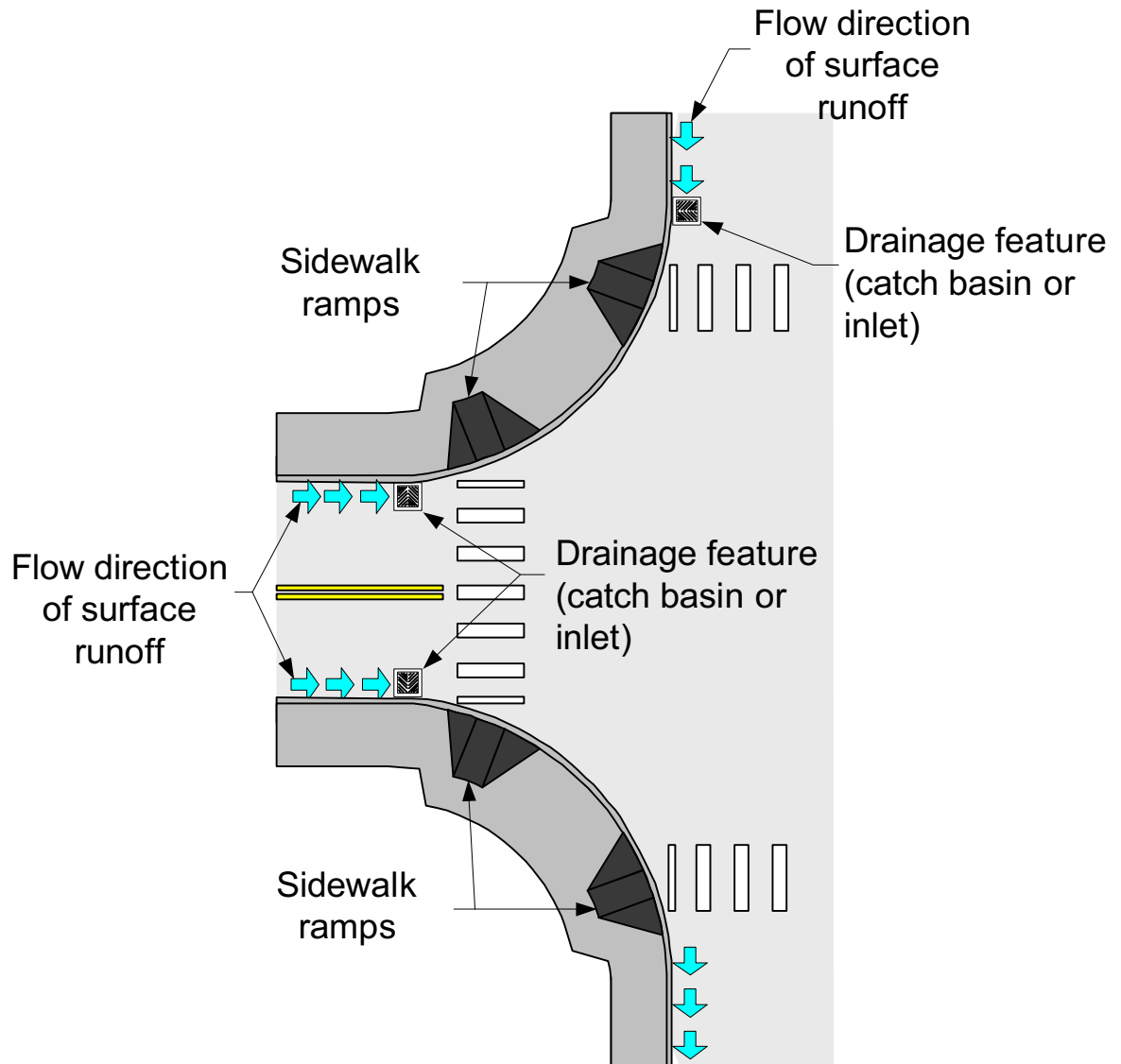
Sight Distance at Intersections
Figure 1025-6b



Sidewalk Bulb Outs
Figure 1025-7



Midblock Pedestrian Crossing
Figure 1025-8



Sidewalk Ramp Drainage
Figure 1025-9